Historical Metallurgy

The first schools of mines and their role in developing the mineral and metal industries. Part 4: Addendum

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Since publication of the series of articles devoted to the School of Mines in the *CIM Bulletin*: November/December 1997, January 1998, and February 1998, the author became aware of other schools that were not mentioned in these articles and he received a number of letters signalling others that were missing. As a result, it was found necessary to add Part 4 to incorporate these additions.

Kongsberg School of Mines in Norway

In 1623, masses of native silver weighing over 180 kg were discovered in a locality in Norway on Lagen River that a year later became known as Kongsberg. The silver contained about 10% copper, 1% to 40% gold, and small traces of lead and mercury. In 1757, a mining academy was founded (Fig. 1) and Kongsberg became the first Norwegian centre of academic life, the precursor of today's University of Oslo, which was opened in 1813. In 1770, Kongsberg became the second largest city in Norway with a population of about 8000, after Bergen which had 14 000 inhabitants, Oslo and Trondheim, 7500 each.

The founding decree of the School was signed by Fredercik V (1723-1766), King of Denmark and Norway, who ruled from 1746 until his death in 1766. At the time of founding the School of Mines, Norway was part of the dual Kingdom Denmark-Norway. After the Napoleonic wars, Denmark, who fought against Napoleon, had to cede Norway to Sweden who supported the winning side. Eventually, Norway gained independence from Sweden in 1905.

In 1912, all mining and metallurgical education, as well as that in geology, were made the responsibility of the newly-established Norwegian Institute of Technology in Trondheim. In 1996, it was renamed the Norwegian University of Science and Technology of which a faculty of applied earth science and petroleum engineering was founded and included geology, mining, and mineral dressing, and another faculty of chemistry and biology which included metallurgy.

Kongsberg, today, maintains a miniature train which carries tourists through the mining tunnels. A short distance from the town centre the emblems of the monarchs of Norway, the Crowns, are engraved on a rock. Kongsberg church has an organ dating from 1750. Other points of interest are the Arsenal, Lagendal Museum, and the Royal Mint.

School of Mines in Pribram, Bohemia

In 1714, a Commission for Mining and Minting was established in Vienna to look after improving mining and metallurgical activities in the Austrian Empire. In 1716, Emperor Charles VI ordered this commission to entrust the administrator of the Mining and Minting Authority in Prague with the introduction of mining education in Bohemia where important mining activities were already in place. J.Fr. Weyr, the caretaker of the Mining Board in Joachimsthal, who had long experience in teaching in private vocational mining schools was appointed to enlarge one of the local schools and equip it with a chemical laboratory. As a result, the first vocational mining school financed by the state began in January 1717 in Joachimsthal. The benefits obtained from this school resulted in an edict from the Vienna Court Chamber dated August 6, 1735. On September 23, 1763, Empress Maria Theresa signed a decree approving J.T.A. Peithner's proposal to deliver lectures on mining at the Philosophical Faculty of Charles University in Prague. When the status of the mining school in Schemnitz was elevated to that of an academy in 1763, the Mining Department in Prague was closed in 1772, and Peithner moved to Schemnitz.

After the Hungarian uprising in 1848 against the ruling Hapsburg emperor, teaching at the Mining Academy in Schemnitz was conducted in Hungarian instead of German. This necessitated the creation of another mining school in the Empire where teaching had to be conducted in German to take care of the Austrian students registered at Schemnitz

Fig. 1. The Kongsberg Mining Academy building from 1786. The Academy was founded in 1757 but closed down in 1814 after the foundation of the University of Oslo (courtesy professor Frank Vokes, Trondheim, Norway).

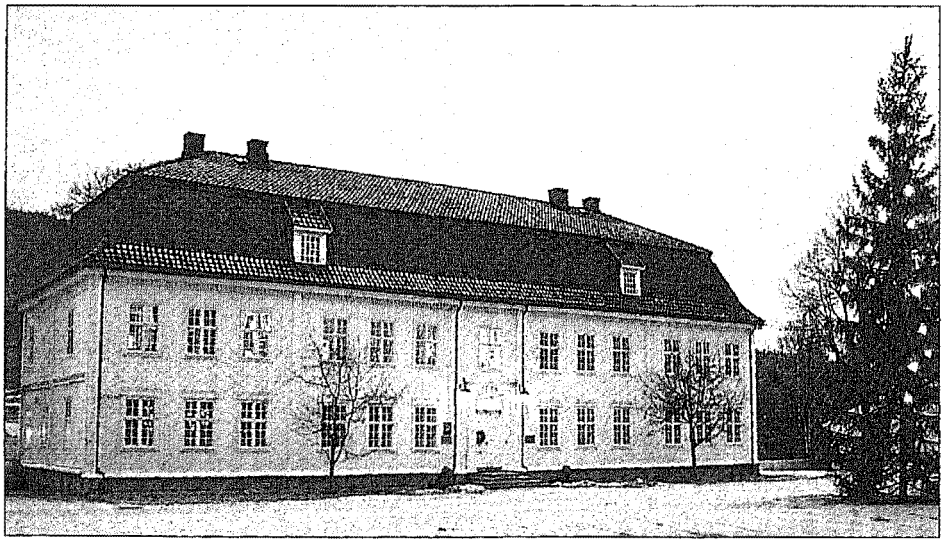
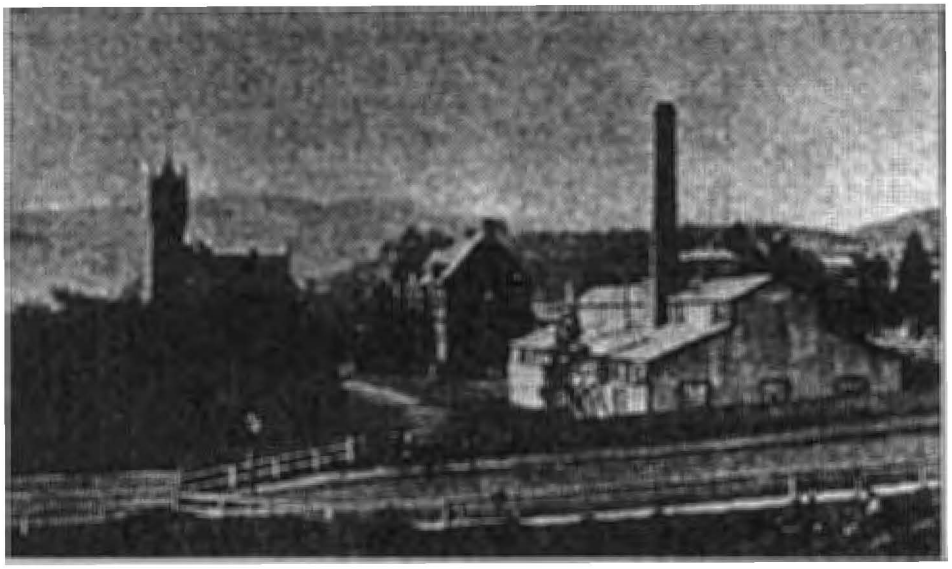


Fig. 2. School of Mines in Madrid, Spain (courtesy professor Octavio Puche).

Fig. 3. Otago School of Mines, New Zealand (courtesy Margret Anderson, Dunedin).



who could not continue their studies there because of the language barrier. The School of Mines in Leoben, founded in 1840, was not enough to cope with the situation. As a result, another school was founded in Pribram, 20 km south of Prague. After World War II, the authorities decided, in 1951, to move the school to Ostrava, an important coal mining centre, and to have it specialize in coal mining technology.

Almadén School of Mines in Spain

Almadén is a small town in the province of Ciudad Real, about 150 km south of Madrid, that was famous for its rich mercury mines that were exploited by the Romans. During the reign of Carlos III (1716-1788), a Mining Academy was founded in Almadén in 1777. The German mining engineer, Heinrich Christoph Storr, was appointed as its director and only teacher. He was known by the book he wrote in German entitled "Course of Mineralogy and Underground Geometry." In October 1781, Storr's son, Johann Heinrich, registered as a student in the Academy. A year later, Andres del Rio registered as a student; he later became a mineralogy professor at the School of Mines in Mexico City.

In 1783, Storr's contract expired and Johan Martin Hoppensak was nominated to succeed him. In 1791 he was, in turn, succeed by another German, Johann Fredrich Mayer. The school at Almadén changed its name many times. In 1841 it was known as the Practical School at Alamdén, in 1914 the Faculty of Mining and Metallurgy, in 1964 the Technical Engineering School of Mining, in 1972 a University, and in 1982 a Polytechnic.

The School of Mines in Madrid

In 1828, José Duro y Garces, a student of Louis Proust in Madrid, established a laboratory for fire assaying and mineralogy. When Fausto Elhuyar returned to Madrid in 1829, after terminating his stay in South America, he helped Garces teach and made plans for the creation of a school of mines around his laboratory. The school was founded after his death and is now part of the University of Madrid (Fig. 2).

Otago School of Mines in New Zealand

The first British missionary arrived in New Zealand in 1814. The colony became a dependency of New South Wales in 1840, a separate British colony in 1841, and a Dominion in 1907. With the support of the Presbyterian church, the superintendent of the Otago Province proposed to the Provincial Council on April 8, 1868 that a University be set up in Dunedin. On June 3, 1869, the Univesity of Otago Ordinance became law, securing for the gold-rich city of Dunedin, New Zealand's first university. The university opened on July 5, 1871 and was composed of four schools:

- School of Mines and Agriculture (Fig. 3);
- School of Mathematics and Natural Science;
- School of Classics, English Language, and Literature; and the
- School of Mental and Moral Philosophy.

In 1874, the University of Otago was affiliated with the University of New Zealand. A few years later, the University admitted women, making it the first academic institution in the Empire to do so. The University was in a constant short supply of funds and it was only through fund-raising efforts of the citizens that the closing of the School of Mines in 1902 was prevented.

In 1964, the School of Mines was renamed the Faculty of Technology to incorporate other engineering courses. However, this faculty was short lived and, in 1965, the course in metallurgical engineering was discontinued and was incorporated into other degrees. By 1969, the year of the University of Otago centenary, there were 4880 students — quite a con-

Fig. 4. School of Mines in Medellin, Colombia (courtesy Ana Cecilia Gariria Cartagena, Medellin).

trast to the 81 who attended the university during its first year of operation, and to the enrolment of approximately 14 500 students in 1994, the year of the university's 125th Jubilee.

One of the most illustrious graduates of Otago Univesity was Josef William Mellor (1869-1938) who is best known for his numerous chemistry textbooks, above all, his 16-volume monumental work *Comprehensive Treatise on Theoretical and Inorganic Chemistry*, in 15 320 pages, published in London between 1922 and 1937.

The School of Mines in Ukraine

Dnepropetsovsk was named Ekaterinoslav until 1926. It is located in central Ukraine on the Dnieper bend, an important river port and railway centre. Growth began in the late nineteenth century with exploitation of Donets Basin coal, Krivoi Rog iron, and Nikopol manganese.

Dnipropetrovske Mining Institute (Dnipropetrovskyi hirnychyi instytut im. Artema), the oldest mining school in Ukraine, was established in 1899 as the Katerynoslav Higher Mining School and became the Mining Institute in 1912. In 1930, some departments of the school became independent institutions, for example, the Metallurgical Institute and the Chemical Technology Institute. The Mining Institute has six faculties: mining, geological prospecting, mine-shaft building, machine building and mechanical, electrotechnical, and general technical (in Oleksandriia). It also has a correspondence school, an evening school, and a graduate program. Since 1905 the institute has published *Izvetiia Dnepropetroskogo gornogo instituta* in Russian, as well as various textbooks and collections of scientific research.

The Medellin School of Mines in Colombia

The present day Colombia was part of what was then known Viceroyalty of New Granada, which comprised Ecuador, Colombia, Venezuela, and Panama, during the Spanish colonial era, with Bogota as its capital. Platinum in the Choco District was already known to the American Indians and its use was banned by the Spanish authorities because it was used to adulterate gold. During the War of Independence, in 1812-1819, the Republic of Gran Colombia was formed. After the death of Bolivar in 1830, the United Republic disintegrated and, in 1863, the United States of Colombia was formed. In 1903, Panama ceded from the union.

Medellin is the second largest city of Colombia after Bogota. Today, it is the centre for the production of coffee and for orchids, of which 25 000 varieties have been identified. These flowers have their roots in the air from which they absorb humidity. Since the seventeenth century a number of botanical expeditions have visited Colombia to study these flowers. Medellin, today, is also a centre of coca plantations and drug lords.

The National School of Mines in Medellin was founded on November 20, 1886, and classes started April 11, 1887, with 26 students (Fig. 4). Medellin was an important gold mining district but the exploitation of the metal was primitive, and the terrain was rough and mountainous. From its beginning, the school also had a Civil Engineering Department to train engineers for road construction and the like. From 1906 to 1911, the school was annexed to the University of Antioquia. In 1935 it became part of the School of Engineering of the National University of Columbia.

Today, the school offers programs in electrical, mechanical, geological, chemical, industrial, and petroleum engineering as well as adminisration. The first teachers of the school were educated in Europe and the United States. One of its most famous graduates was Mariano Ospina Perez, president of the Republic of Colombia.

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